

Claims

1. A system for the storage of electrical energy comprising electrolysis means connectable to supplies of water and electricity and operable to provide the electrolysis of water to generate hydrogen, reaction means for receiving hydrogen generated by said electrolysis means, the reaction means providing the reaction of said hydrogen with carbon dioxide to form a storage compound, means for the supply of carbon dioxide to said reaction means, and storage means connected to said reaction means for the storage of said storage compound.
2. A system as claimed in claim 1 which further comprises electricity generating means connectable to the electrolysis means to supply electricity.
3. A system as claimed in claim 1 or claim 2 further comprising regeneration means for the generation of electrical energy either directly or indirectly from the storage compound.
4. A system as claimed in claim 3 wherein the regeneration means comprise a fuel cell or generator for the generation of electrical energy directly from the storage compound.
5. A system as claimed in claim 3 wherein the regeneration means comprise further reaction means to convert the storage compound back into hydrogen and means for the generation of electrical energy from said hydrogen.
6. A system as claimed in claim 1 or claim 2 which further comprises an internal combustion engine connectable to the storage means.

7. A system for the storage of hydrogen, said system comprising reaction means providing the reaction of hydrogen with carbon dioxide to form a storage compound, means for the supply of hydrogen and carbon dioxide to said reaction means, storage means connected to said reaction means for the storage of said storage compound, and further reaction means connectable to said storage means and providing the conversion of the storage compound back into hydrogen.
8. A system for the production and storage of hydrogen, said system comprising electrolysis means connectable to supplies of water and electricity and operable to provide the electrolysis of water to generate hydrogen, reaction means for receiving hydrogen generated by said electrolysis means, the reaction means providing the reaction of said hydrogen with carbon dioxide to form a storage compound, means for the supply of carbon dioxide to said reaction means, storage means connected to said reaction means for the storage of said storage compound, and further reaction means connectable to said storage means and providing the conversion of the storage compound back into hydrogen.
9. A system as claimed in any of claims 1 to 8 wherein the storage compound is a  $C_{1-8}$  alcohol, a Fischer-Tropsch liquid, Mobil gasoline, a  $C_{1-8}$  acid, a  $C_{1-8}$ -aldehyde, a  $C_{1-8}$ -ether or a  $C_{1-8}$ -hydrocarbon.
10. A system as claimed in any of claims 1 to 8 wherein the storage compound is methanol.
11. A method for the storage of electrical energy utilising carbon dioxide and water, the method comprising the following steps:
- (a) electrolysis of water to yield hydrogen;

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- (b) reaction of the hydrogen from step (a) with carbon dioxide to form at least one storage compound or a storage compound/water mixture;
- (c) storage of said storage compound or storage compound/water mixture; and
- (d) subsequent use of said storage compound or storage compound/water mixture to fuel an internal combustion engine or to generate electricity either directly or indirectly.
12. A method as claimed in claim 11 wherein in step (d) the storage compound or storage compound/water mixture is converted back into hydrogen and the hydrogen is used to generate electricity.
13. A method as claimed in either of claims 11 or 12 wherein a storage compound/water mixture is used in steps (c) and (d).
14. A method for the storage of electrical energy, said method comprising the following steps:
- (a) electrolysis of water to yield hydrogen;
- (b) reaction of the hydrogen from step (a) to form a methanol/water mixture;
- (c) storage of the methanol/water mixture; and
- (d) subsequent use of the methanol/water mixture in an internal combustion engine or to generate electricity either directly or indirectly.
15. A method for the production and storage of hydrogen, said method comprising the following steps:
- (a) electrolysis of water to yield hydrogen;
- (b) reaction of the hydrogen from step (a) with carbon dioxide to form at least one storage compound;

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(c) storage of said storage compound; and

(d) subsequent conversion of said storage compound back into hydrogen.

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16. A method for the storage of hydrogen, said method comprising the following steps:

10 (a) reaction of hydrogen with carbon dioxide to form at least one storage compound;

(b) storage of said storage compound; and

15 (c) subsequent conversion of said storage compound back into hydrogen.

17. A method as claimed in any of claims 11 to 16 wherein the storage compound is a  $C_{1-8}$  alcohol, a Fischer-Tropsch liquid, Mobil gasoline, a  $C_{1-8}$  acid, a 20  $C_{1-8}$ -aldehyde, a  $C_{1-8}$ -ether or a  $C_{1-8}$ -hydrocarbon.

18. A method as claimed in any of claims 11 to 16 wherein the storage compound is methanol.